Infection Control and Prevention
Module 4

Objectives

Purpose:

All clinical staff should be able to identify concerning cases, know how to implement isolation and other precautions, and appropriately report communicable diseases.

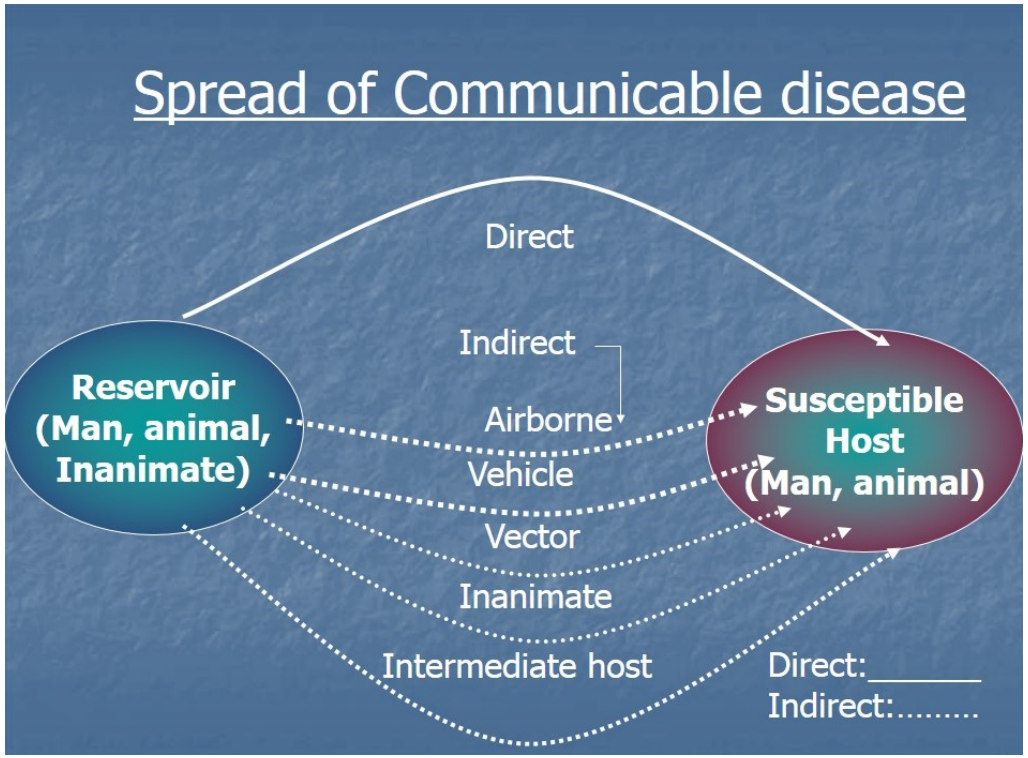
Objectives:

- Know how to detect, track, and report communicable diseases
- Learn how to protect staff and patients through adherence to safe systems of work
- Define isolation and quarantine restrictions and requirements

Communicable Disease Basics

Communicable Diseases

"Communicable diseases are infectious diseases that are spread from person to person – such as E. coli, Salmonella or chickenpox – or from animals to people, like rabies or H1N1. Our epidemiologists and nurses work to prevent, detect, manage and control infectious diseases." (Public Health Accreditation Board, 2019 p.1).



(Public Health Accreditation Board, 2019)

Common Communicable Diseases

- Common communicable diseases include:
  - Common cold
  - Influenza
  - Strep throat
  - Gastroenteritis
  - Pink eye
  - Chlamydia
  - Herpes
  - Chickenpox
  - Hepatitis

(Anderson, 2018)

Modes of Transmission

1. Direct contact
   - Person to person, animal to person, mother to unborn child
   - Example: Anthrax
2. Indirect contact
   - Coughing, sneezing, talking, picking up left behind germs
   - Example: Smallpox
3. Vector-borne
   - Insect carriers – mosquitos, fleas, lice or ticks
   - Example: West Nile Virus
4. Food-borne
   - Contaminated food and water
   - Example: E. coli

(Mayo Clinic, 2018)

Communicable Disease Detection

- Communicable diseases may be detected during initial patient screening and continuing assessments through:
  - Identification of symptoms or syndromes such as cough, fever, diarrhea, or rash
  - Report of travel to a geographic area with a known outbreak or endemic disease
  - Reported contact with someone who is ill
- Disease-specific screening may be implemented in consultation with public health officials during outbreaks of concern.

Question 1:

Which communicable disease is NOT found to be common?

Select the correct multiple choice answer.

A. Cold

B. Hepatitis A

C. Chickenpox

D. Ebola virus disease

E. Pink Eye

Question 1:

Which communicable disease is NOT found to be common?

Select the correct multiple choice answer.

A. Cold

B. Hepatitis A

C. Chickenpox

D. Ebola virus disease

E. Pink Eye

The correct answer is D.

Question 2:

Which of the following may indicate a patient is infected with a communicable disease?

Select the correct multiple choice answer.

A. Complaints of cough, fever, or rash
B. Report of recent travel to an area with a known outbreak
C. Reported contact with a sick person
D. All of the above

Question 2:

Which of the following may indicate a patient is infected with a communicable disease?

Select the correct multiple choice answer.

A. Complaints of cough, fever, or rash

B. Report of recent travel to an area with a known outbreak

C. Reported contact with a sick person

D. All of the above

The correct answer is D.

Ebola and Other Special Pathogens

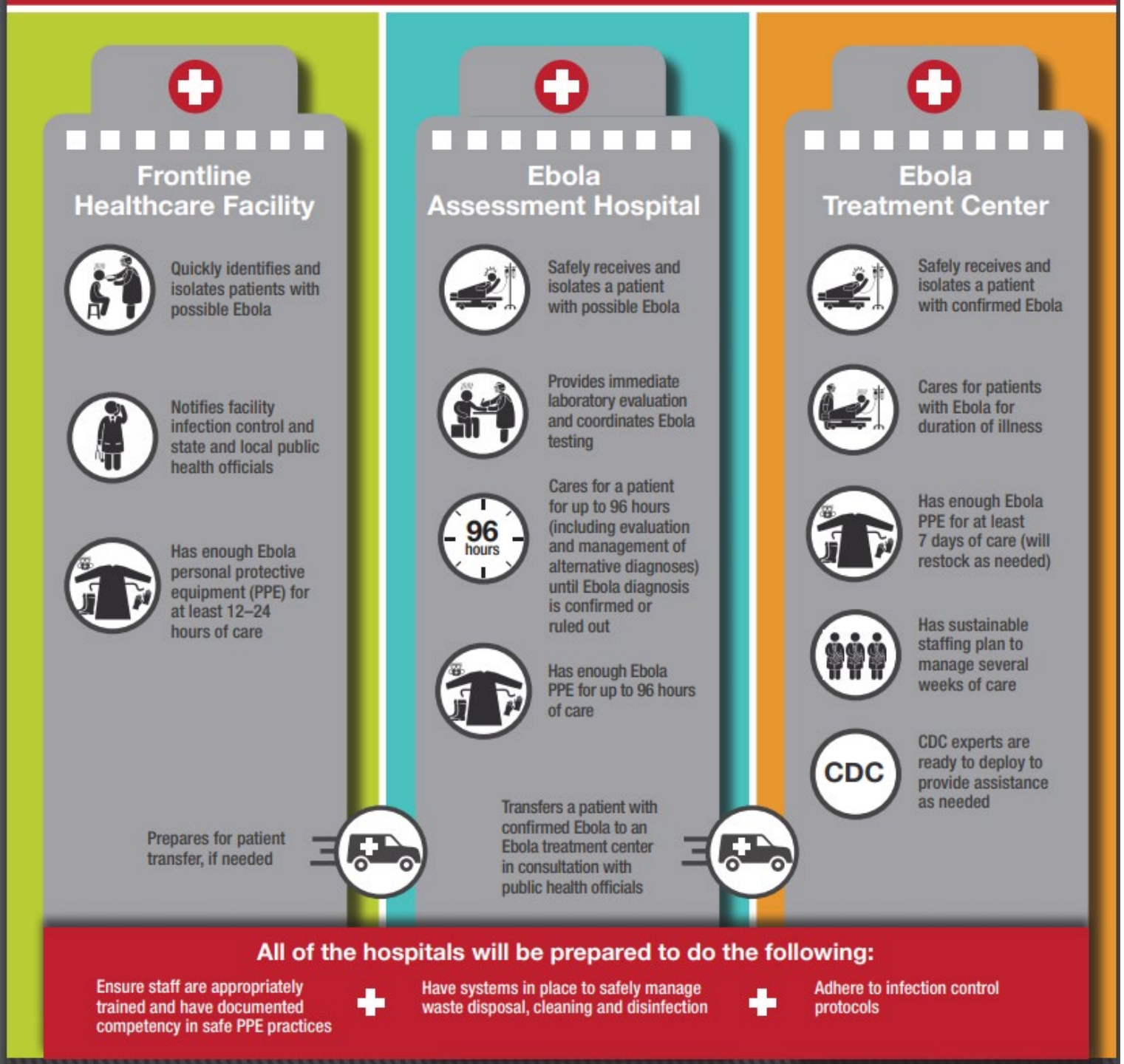
Uncommon Communicable Diseases

- Less common communicable diseases can present at any facility at any stage of illness.
- These include travel-associated and emerging/re-emerging diseases such as Ebola virus disease, other viral hemorrhagic fevers, Middle East Respiratory Syndrome, and novel influenza.
- Hospital staff are often the first to suspect or detect a patient is infected with a special pathogen.
- Special pathogens pose a significant risk to healthcare personnel and require specific facility processes to enable early identification and isolation of infected patients and the use of effective infection control practices to prevent disease transmission.

Hospital Tiers and Preparedness

- In response to the 2014-2016 Ebola outbreak, the federal government established a tiered, regional system for the management of patients with Ebola and other special pathogens.
- The nationwide treatment network includes:
  - Regional Ebola and other special pathogen treatment centers
  - State or jurisdiction Ebola treatment centers
  - Assessment hospitals
  - Frontline healthcare facilities
- Facilities in all tiers should be able to identify and isolate patients with a suspected special pathogen infection and inform internal and external stakeholders.

(ASPR, 2017)


Frontline Healthcare Facility
Quickly identifies and isolates patients with possible Ebola
Notifies facility infection control and state and local public health officials
Has enough Ebola personal protective equipment (PPE) for at least 12–24 hours of care
Prepares for patient transfer, if needed
Ebola Assessment Hospital
Safely receives and isolates a patient with possible Ebola
Provides immediate laboratory evaluation and coordinates Ebola testing
96 hours
Cares for a patient for up to 96 hours (including evaluation and management of alternative diagnoses) until Ebola diagnosis is confirmed or ruled out
Has enough Ebola PPE for up to 96 hours of care
Transfers a patient with confirmed Ebola to an Ebola treatment center in consultation with public health officials
Ebola Treatment Center
Safely receives and isolates a patient with confirmed Ebola
Cares for patients with Ebola for duration of illness
Has enough Ebola PPE for at least 7 days of care (will restock as needed)
Has sustainable staffing plan to manage several weeks of care
CDC
CDC experts are ready to deploy to provide assistance as needed
All of the hospitals will be prepared to do the following:
Ensure staff are appropriately trained and have documented competency in safe PPE practices
+
Have systems in place to safely manage waste disposal, cleaning and disinfection
+
Adhere to infection control protocols

(CDC, 2018)

State Tiering Structure

Many states have developed processes for care of highly contagious diseased patients. This is an example of the Michigan structure.

Four Tiers of MI Hospitals Ebola Virus Disease - Preparedness & Response

02/28/2017

MDHHS is working with each Michigan hospital to identify the level of infrastructure available to detect, isolate, notify and treat a patient with a known or suspected special pathogen. To maintain situation awareness of hospital capabilities, all MI hospitals will be linked to one of four tiers as noted in the chart below. It is important to note that the specific tier identified for each hospital may change as hospital capabilities are reassessed based on the completion of training, education and exercising as well as the availability of personal protective equipment. This information is critical for local and state public health, hospitals and EMS agencies to ensure that the right patient goes to the right facility at the right time.

Hospital	Isolate	Screen	Test	Number of hours prepared to hold patient	Transfer to another treatment facility	Receiver (Accept patients from other hospitals)
Tier 1	Yes	Yes	Yes	Duration of Illness	No	Yes
Tier 2	Yes	Yes	Yes	Duration of Illness	No	No
Tier 3	Yes	Yes	Yes	96 hours	Yes	No
Tier 4	Yes	Yes	No	24 hours	Yes	No

BETP
Bureau of EMS, Trauma & Preparedness

(Michigan Department of Community Health, 2017)

Question 3:

All tiers of facilities are equipped to:

Select the correct multiple choice answer.

A. Provide test results
B. Identify the case
C. Accept transfers

Question 3:

All tiers of facilities are equipped to:

Select the correct multiple choice answer.

A. Provide test results
B. Identify the case
C. Accept transfers

The correct answer is B.

Question 4:

True or False?

The regional, tiered response system is only intended for the management of Ebola virus disease patients.

Question 4:

True or False?

The regional, tiered response system is only intended for the management of Ebola virus disease patients.

The correct answer is FALSE.

Isolation and Quarantine

Isolation vs. Quarantine

Isolation

For people who are sick

- Separates people who are sick from those who are not sick
- Restricts the movement of people who have a contagious disease to stop the spread of the illness
- Allows for appropriate treatment in a hospital setting
- Requires appropriate personal protective equipment (PPE) for those coming into contact with the person who is sick
- Requires proper infection control and sterilization measures

Quarantine

For people who were exposed but are not sick

- Applies to people who may or may not become sick
- Restricts the movement of healthy people who may develop a disease after potential exposure to the virus
- May require people to remain in a designated location, like their home, for up to 21 days
- Requires active monitoring, including taking temperature two times per day and checking for other symptoms
- PPE is not required for contact with people who are not ill

(Chatham County Public Health Department, 2014; CDC, 2014)

Possible Variables/Risks to Maintaining Isolation

Isolation procedures are put into place for patients who have infectious, communicable diseases.

Before following isolation procedures, it is important to identify all possible variables/risks to maintaining isolation.

Probable isolation variables include but are not limited to:

- The act of a patient refusing isolation/quarantine or improperly complying with all aspects of isolation
- Exposure to other staff and patients
- Lack of PPE
- Healthcare staff bias versus clinical status/procedure
- Transmission of diseases

Ethical Measures

It is important to be respectful and remain unbiased when following quarantine and isolation procedures.

Health employees should consider:

- Educating patients and community members on the public health threat and potential exposure to others
- Encouraging patients to voluntarily adhere to the quarantine and isolation procedures, yet support patients if procedures are denied
- Protecting individuals' rights by ensuring confidentiality

(American Medical Association, n.d.)

Question 5:

True or False?

Isolation is the process of separating patients who are ill from those who are not ill.

Question 5:

True or False?

Isolation is the process of separating patients who are ill from those who are not ill.

The correct answer is TRUE.

Question 6:

True or False?

Quarantine restricts the movement of healthy individuals who may have been exposed to a communicable disease for the duration of the incubation period or until they become ill.

Question 6:

True or False?

Quarantine restricts the movement of healthy individuals who may have been exposed to a communicable disease for the duration of the incubation period or until they become ill.

The correct answer is TRUE.

Reporting of Communicable Diseases

Reporting Communicable Diseases

- Approximately 120 conditions are reportable (also known as nationally notifiable diseases)
- Reportable diseases are reported to national agencies by contacting any of these three appropriate agencies:
  - Report to the local health department
  - Report to the state health department
  - Report to the CDC if directed
- When a special pathogen case is suspected, internal and external stakeholders should be informed according to facility and regional plans.

(Medline Plus, 2019)

Examples of Reportable Diseases

- Anthrax
- Hepatitis A, B, C
- Measles/Mumps/Rubella
- Novel influenza A virus infections
- Pertussis
- Severe Acute Respiratory Syndrome (SARS)
- Smallpox
- Staphylococcus aureus, vancomycin intermediate/resistant (VISA/VRSA)
- Viral hemorrhagic fever

(CDC, 2019)

Safety Measures

Standard Precautions

Standard precautions include a group of infection prevention practices that apply to all patients, regardless of suspected or confirmed infection status, in any setting in which healthcare is delivered.

Standard precautions include:

- Hand hygiene
- PPE use
- Safe injections
- Safe handling to avoid contamination
- Respiratory hygiene/ cough etiquette

(CDC, 2007)

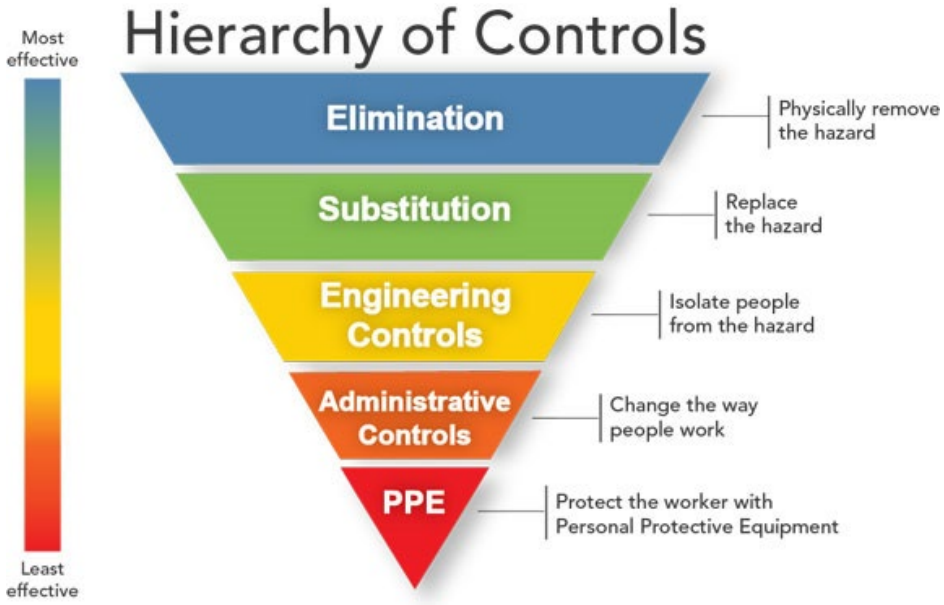
Transmission-Based Precautions

- Transmission-based precautions are the second tier of infection control and are used in addition to standard precautions
- These additional precautions are intended to prevent disease transmission via:
  - Contact
  - Droplet
  - Airborne

(CDC, 2007)

Safe Systems of Work

- Preventing transmission of infectious diseases in hospitals requires adherence to safe systems of work.
- Infection control and prevention measures fall under a five-level hierarchy of controls.



(NIOSH, 2015)

Examples of Controls

- Engineering controls include:
  - Use of an airborne infection isolation room or other designated isolation room
  - Designated cold, warm, and hot zones for personal protective equipment donning and doffing
- Administrative controls include:
  - Workplace safety programs
  - Vaccination of healthcare personnel
  - Infection control and prevention protocols
  - Plans, procedures, algorithms, checklists

Personal Protective Equipment

- Personal protective equipment (PPE) is considered the least effective control.
- Selection is based on the route of transmission of the pathogen, the level of exposure anticipated, the appropriateness for the task, and fit.
- Staff should perform proper fit testing and demonstrate an understanding of received PPE training.

Personal Protective Equipment (PPE)

Protect staff and patients by following the steps to improve the PPE compliance program:

- Identify threats that cannot be relieved by any other means (PPE is the only obtainable option)
- Identify patients potentially exposed to pathogens
- Select the appropriate PPE that provides the necessary level of protection using your organization's isolation procedures or CDC and OSHA guidelines
- Train a team on the proper use of the selected PPE and practice proper donning and doffing
- The individual performing decontamination should be given choices of various options and sizes, so that they have the opportunity to achieve a comfortable and proper fit

(Infection Control Today, 2012)

Levels of PPE

- There are four levels of PPE that are selected based on the degree of protection needed.
- Not all levels are typically used in hospitals.

Level A Personal Protective Equipment (PPE)

Level A PPE is worn when the highest level of protection is required.

Typical level A PPE includes:

- Positive pressure self contained breathing apparatus (SCBA)
- A fully encapsulating chemical protective suit
- Chemical resistant inner gloves
- Chemical resistant outer gloves
- Chemical resistant boots, steel toe and shank

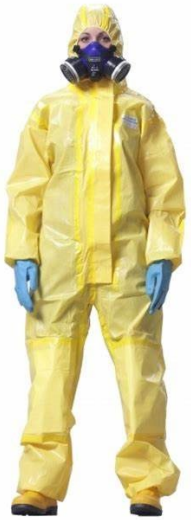
(U.S. Department of Health and Human Services, 2017).

Level B Personal Protective Equipment (PPE)

Level B PPE is worn when the highest level of respiratory protection is needed, but lesser level of skin protection.

Typical level B PPE includes:

- Positive pressure self contained breathing apparatus (SCBA)
- Chemical resistant clothing
- Chemical resistant inner gloves
- Chemical resistant outer gloves
- Chemical resistant outer boots, steel toe and shank



(U.S. Department of Health and Human Services, 2017).

Level C Personal Protective Equipment (PPE)

Level C PPE is worn when the type of airborne substance is known and concentrated, with skin/eye exposure being unlikely

Typical level C PPE includes:

- Full-face or half-mask, air purifying respirator
- Chemical resistant clothing
- Chemical resistant inner gloves
- Chemical resistant outer gloves
- Chemical resistant boots, steel toe and shank

(U.S. Department of Health and Human Services, 2017).

Level D Personal Protective Equipment (PPE)

Level D PPE is worn during daily hospital tasks. Level D PPE is considered the standard work uniform.

Typical level D PPE includes:

- Masks: surgical, N95, mask with face shield
- Coveralls, gowns, scrub pants and shirts
- Work clothes
- Boots
- Gloves
- Aprons

(U.S. Department of Health and Human Services, 2017)

Understanding PPE Risks

- Higher levels of PPE present additional risks to staff.
- Poorly fitted PPE can: create a tripping/ slipping hazard, force poor body mechanics, or create gaps at critical junctions leading to contamination
- Properly fitted PPE can: restrict range of motion, narrow the visual field, create heat buildup and retention, or add emotional and physical stressors

Question 7:

Standard precautions including hand washing, use of PPE, and cough etiquette are all efforts to:

Select the correct multiple choice answer:

A. Prevent transmission of communicable diseases
B. Make sure hospital staff are following protocol
C. Ensure cleanliness
D. None of the above

Question 7:

Standard precautions including hand washing, use of PPE, and cough etiquette are all efforts to:

Select the correct multiple choice answer:

A. Prevent transmission of communicable diseases

B. Make sure doctors are completing protocol

C. Ensure cleanliness

D. None of the above

The correct answer is A.

Question 8:

True or False?

Vaccination is an administrative control to reduce the transmission of communicable diseases.

Question 8:

True or False?

Vaccination is an administrative control to reduce the transmission of communicable diseases.

The correct answer is TRUE.

Question 9:

Which Personal Protective Equipment (PPE) level provides the most protection for users?

Select the correct multiple choice answer.

A. Level C
B. Level A
C. Level D
D. Level B

Question 9:

Which Personal Protective Equipment (PPE) level provides the most protection for users?

Select the correct multiple choice answer.

A. Level C
B. Level A
C. Level D
D. Level B

The correct answer is B.

Question 10:

True or False?

PPE is the most effective control hospital can implement to protect staff and patients?

Question 10:

True or False?

PPE is the most effective control hospital can implement to protect staff and patients?

The correct answer is FALSE.

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